

CLAIMS:

1. A method for implanting a prosthesis within a body passageway comprising the steps of:

utilizing a thin-walled, tubular member as the prosthesis, the tubular member having a plurality of slots formed therein, the slots being disposed substantially parallel to the longitudinal axis of the tubular member;

disposing the prosthesis upon a catheter;

inserting the prosthesis and catheter within the body passageway by catheterization of said body passageway; and

expanding and deforming the prosthesis at a desired location within the body passageway by expanding a portion of the catheter associated with the prosthesis to force the prosthesis radially outwardly into contact with the body passageway, the prosthesis being deformed beyond its elastic limit.

2. The method of claim 1, further including the steps of: collapsing the portion of the catheter associated with the prosthesis, and removing the catheter from the body passageway.

3. The method of claim 1, including the steps of: utilizing a catheter having an expandable, inflatable portion associated therewith; and the expansion and deformation of the prosthesis and the

5 portion of the catheter is accomplished by inflating the expandable, inflatable portion of the catheter.

4. The method of claim 1, wherein the slots are uniformly and circumferentially spaced from adjacent slots and the slots are uniformly spaced from adjacent slots along the longitudinal axis of the tubular member, whereby at least one elongate member is formed between adjacent slots.

5. The method of claim 4, wherein each slot has first and second ends, and the first and second ends of each slot are disposed intermediate the first and second ends of adjacent slots along the longitudinal axis of the tubular member.

6. The method of claim 5, wherein the thin-walled tubular member and the elongate members disposed between adjacent slots have a uniform wall thickness.

7. The method of claim 1, wherein the thin-walled tubular member is expanded and deformed to a second diameter within the body passageway; the second, expanded diameter being variable and determined by the internal diameter of the body passageway, whereby the expanded thin-walled tubular member will not migrate from the desired location within the body passageway and the expansion of the thin-walled tubular member does not cause a rupture of the body passageway.

8. The method of claim 7, wherein the thin-walled tubular member is uniformly, outwardly expanded and deformed along its length.

9. The method of claim 1, wherein the thin-walled tubular member is provided with a biologically inert coating on the outer surface of the thin-walled tubular member.

10. The method of claim 9, wherein the coating is provided with a means for anchoring the prosthesis to the body passageway.

11. The method of claim 10, wherein the means for anchoring is the coating being provided with a plurality of radially, outwardly extending projections for engagement with the body passageway.

12. The method of claim 9, wherein the coating is provided with a plurality of openings to allow communication between the body passageway and the interior of the thin-walled tubular member.

13. An expandable intraluminal vascular graft, comprising:

5           a thin-walled tubular member having first and second ends and a wall surface disposed between the first and second ends, the wall surface having a substantially uniform thickness and a plurality of slots formed therein, the slots being disposed  
10           substantially parallel to the longitudinal axis of the tubular member;

15           the tubular member having a first diameter which permits intraluminal delivery of the tubular member into a body passageway having a lumen; and

a the tubular member having a second, expanded <sup>and deformed</sup> diameter, upon the application from the interior of the tubular member of a radially, outwardly extending force, which second diameter is variable and dependent upon the amount of force applied to the tubular member, whereby the tubular member may be expanded and deformed to expand the lumen of the body passageway.

14. The expandable intraluminal vascular graft of claim 13, wherein the slots are uniformly and circumferentially spaced from adjacent slots and the slots are uniformly spaced from adjacent slots along the longitudinal axis of the tubular member, whereby at least one elongate member is formed between adjacent slots.

15. The expandable intraluminal vascular graft of claim 14, wherein each slot has first and second ends, and the first and second ends of each slot are disposed intermediate the first and second ends of adjacent slots along the longitudinal axis of the tubular member.

16. The expandable intraluminal vascular graft of claim 13, wherein the tubular member does not exert any outward, radial force while the tubular member has the first or second, expanded diameter.

17. The expandable intraluminal vascular graft of claim 13, wherein the slots have a substantially rectangular configuration when the tubular member has the first diameter; and the slots have a substantially hexagonal

-26-

5 configuration when the tubular member has the second, expanded diameter.

18. The expandable intraluminal vascular graft of claim 13, wherein the slots have a configuration which is substantially a parallelogram after the tubular member has been expanded and deformed into the second expanded diameter.

5 19. The expandable intraluminal vascular graft of claim 13, wherein the tubular member has a biologically inert coating on the wall surface.

20. The expandable intraluminal vascular graft of claim 19, wherein the coating includes a means for anchoring the tubular member to the body passageway.

21. The expandable intraluminal vascular graft of claim 20, wherein the anchoring means is a plurality of radially, outwardly extending projections formed on the coating.

22. The expandable intraluminal vascular graft of claim 19, wherein the coating has a plurality of openings therein to allow communication between the body passageway and the interior of the tubular member.

23. The expandable intraluminal vascular graft of claim 13, wherein the outside of the wall surface of the tubular member is a smooth surface, when the tubular member has the first diameter.

24. An expandable prosthesis for a body passageway, comprising:

5 a thin-walled tubular member having first and  
second ends and a wall surface disposed  
between the first and second ends, the wall  
surface having a substantially uniform  
thickness and a plurality of slots formed  
therein, the slots being disposed  
10 substantially parallel to the longitudinal  
axis of the tubular member;

the tubular member having a first diameter which  
permits intraluminal delivery of the tubular  
member into a body passageway having a lumen;  
15 and

*a* the tubular member having a second, *and deformed* expanded  
diameter, upon the application from the  
interior of the tubular member of radially,  
20 outwardly extending force, which second  
diameter is variable and dependent upon the  
amount of force applied to the tubular member,  
whereby the tubular member may be expanded and  
25 deformed to expand the lumen of the body  
passageway.

25. The expandable prosthesis for a body passageway of  
claim 24, wherein the tubular member has a biologically  
inert coating on the wall surface.

26. The expandable prosthesis for a body passageway of  
claim 25, wherein the coating includes a means for  
anchoring the tubular member to the body passageway.

27. The expandable prosthesis for a body passageway of  
claim 26, wherein the anchoring means is a plurality of

radially, outwardly extending projections formed on the coating.

28. The expandable prosthesis for a body passageway of claim 25, wherein the coating has a plurality of openings therein to allow communication between the body passageway and the interior of the tubular member.

5 29. The expandable prosthesis of claim 24, wherein the the slots are uniformly and circumferentially spaced from adjacent slots and the slots are uniformly spaced from adjacent slots along the longitudinal axis of the tubular member, whereby at least one elongate member is formed between adjacent slots.

5 30. The expandable prosthesis of claim 29, wherein each slot has first and second ends, and the first and second ends of each slot are disposed intermediate the first and second ends of adjacent slots along the longitudinal axis of the tubular member.

31. The expandable prosthesis of claim 24, wherein the tubular member does not exert any outward, radial force while the tubular member has the first or second, expanded diameter.

5 32. The expandable prosthesis of claim 24, wherein the slots have a substantially rectangular configuration when the tubular member has the first diameter; and the slots have a substantially hexagonal configuration when the tubular member has the second, expanded diameter.

33. The expandable prosthesis of claim 24, wherein the slots have a configuration which is substantially a

parallelogram after the tubular member has been expanded and deformed into the second expanded diameter.

34. The expandable prosthesis of claim 24, wherein the outside of the wall surface of the tubular member is a smooth surface, when the tubular member has the first diameter.

35. An apparatus for intraluminally reinforcing a body passageway, comprising:

5 an expandable and deformable, thin-walled tubular prosthesis having first and second ends, and a wall surface disposed between the first and second ends, the wall surface having a plurality of slots formed therein, the slots being disposed substantially parallel to the longitudinal axis of the prosthesis; and

10 a catheter, having an expandable, inflatable portion associated therewith and including means for mounting and retaining the expandable, thin-walled tubular prosthesis on the expandable, inflatable portion,

15 whereby upon inflation of the expandable, inflatable portion of the catheter, the prosthesis is expanded and deformed radially outwardly into contact with the body passageway.

20 36. The apparatus of claim 35, wherein the mounting and retaining means comprises retainer ring members disposed on the catheter adjacent the expandable, inflatable portion and adjacent each end of the expandable, tubular prosthesis.



37. An apparatus for expanding the lumen of a body passageway comprising:

5           an   expandable   and   deformable   thin-walled  
          intraluminal vascular graft having first and  
          second ends, and a wall surface disposed  
          between the first and second ends, the wall  
          surface having a plurality of slots formed  
          therein, the slots being disposed  
10           substantially parallel to the longitudinal  
          axis of the graft; and

          a catheter, having an expandable, inflatable  
          portion associated therewith and including  
15           means for mounting and retaining the  
          expandable, deformable intraluminal vascular  
          graft on the expandable, inflatable portion,

20           whereby upon inflation of the expandable, inflatable  
          portion of the catheter, the intraluminal vascular graft  
          is expanded and deformed radially outwardly into contact  
          with the body passageway.

38. The apparatus of claim 37, wherein the mounting and  
          retaining means comprises retainer ring members disposed  
          on the catheter adjacent the expandable, inflatable  
          portion and adjacent each end of the expandable  
5           intraluminal vascular graft.

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